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Intravenous Fluids and the Hospitalized Dying: A Medical Last Rite?

SUMMARY

The authors examined charts for evidence of the use of intravenous fluids in all patients who died from malignant disease occurring in a tertiary care teaching hospital during a one-year period. Of 106 patients who were identified, 86 received intravenous fluids within their last 30 days of life, and 73 died with an intravenous line running. Intravenous fluid use appeared to be independent of age, sex, language, presence of family members, primary tumour site, presence of metastases, duration of illness, and presence of a "no cardiopulmonary resuscitation" order. Total lengths of stay and survival time after obtaining "do not resuscitate" orders were longer in those who died without intravenous fluids. More than two-thirds of patients with cancer who died in hospital did so with an intravenous line. (*Can Fam Physician* 1990; 36:883–886.)

RÉSUMÉ

Les auteurs ont examiné, sur une période d'un an, les dossiers de tous les patients décédés d'une néoplasie maligne dans un hôpital de soins tertiaires à vocation d'enseignement à la recherche de données concernant l'administration de liquides intraveineux. Des 106 patients identifiés, 86 ont reçu des liquides intraveineux au cours des 30 derniers jours de vie et 73 d'entre eux sont décédés alors qu'ils recevaient un soluté. Les variables telles âge, sexe, langue, présence de membres de la famille, site primaire de la tumeur, présence de métastases, durée de la maladie et ordre de «ne pas réanimer» le patient n'ont pas influencé cette pratique. La durée du séjour et le temps de survie après avoir reçu l'ordre de «ne pas réanimer» furent plus longs chez ceux qui sont décédés sans aucun soluté. Plus des deux tiers des patients cancéreux décédés à l'hôpital recevaient un soluté.

Key words: "do not resuscitate" orders, family medicine, intravenous fluid administration, oncology, palliative care

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IS INTRAVENOUS fluid therapy a procedural last rite in patients who are dying in our hospitals? Has it become a standard of terminal hospital care?

We think this question is important because of the frequency with which we encounter, during palliative care consultations, dying patients receiving IV fluids. Patients are given IV fluids for many reasons. Some reasons seem appropriate, some unclear, and some inappropriate.

How often are IV fluids given to dying patients? Micetich and colleagues[1] reported a survey of physician attitudes toward IV fluid use. For an irreversibly comatose cancer patient with incurable disease, 73% of physicians surveyed viewed IV fluids, at appropriate hydrating rates, as proper care. There is no literature relating this finding to what physicians actually do. The purpose of our study was to determine the current use of IV lines in the terminal hospital care of patients with cancer.

Methods

Based on International Classification of Disease (ICD-9) codes, the charts of all individuals with a malignant neoplasm who died between April 1, 1985, and March 31, 1986, were identified. The charts of patients younger than 20 were excluded. The retrospective audit occurred at McMaster University Medi-

cal Centre, a 400-bed tertiary care teaching hospital in Hamilton, Ontario.

The charts were examined for evidence of the presence or absence of an IV line during the last 30 days of life. Other information gathered included factors we thought might influence the decision for or against an IV line. These included age, presence of family members, principal language spoken, site of primary tumour, the presence of known metastatic disease, duration of illness, length of hospital stay, the presence of a "do not resuscitate" (DNR) order, and the length of survival after that order.

Descriptive information from the clinical progress notes was also collected to establish the type and frequency of documentation about the indications for IV therapy.

Using Student's *t* test, the mean age, duration of illness, length of stay, and survival time post-DNR order were compared for those dying with and without an IV line. A chi-square method was used to compare the group receiving IV fluids with the group without an IV line for the presence or absence of a DNR order, presence or absence of metastases, and primary tumour sites.

Results

Of the 106 patients who died from malignant neoplasm and who met the audit inclusion requirements, 86 (81%) had an IV line during the last 30 days of their lives. At the actual time of death, 13 IV lines had been discontinued, leaving 73 (69%) in place until death.

The mean age of these individuals was 66.4 years (range 27 to 96) with 48 (45%) men and 58 (55%) women. One hundred one (95%) spoke English, and 103 (97%) had family members available during the last hospital admission.

Those who died without an IV line had a longer hospital stay (mean 33.9 days) than those who died with an IV line (mean 19.9 days) ($p=0.05$). Also, the mean length of survival post-DNR order (Table 1) was longer (20.9 days) in the group without an IV when compared with the IV group (9.7 days) ($p < 0.05$).

No significant differences could be shown between the groups for mean age or mean duration of illness (Table 1); the presence or absence of a DNR order (Table 2); or the presence or absence of metastatic disease (Table 3). When patients in both groups were categorized by the site of primary tumour location (Table 4), no significant difference in the distributions could be shown between sites ($p > 0.10$).

Sixty-four (60%) charts provided some medical indication for IV use. These included (in decreasing order of frequency) the delivery of non-analgesic medications, the provision of hydration, the delivery of opioid analgesics, the administration of blood and blood products, and the provision of peripheral hyperalimentation. When hydration was a reason for use ($n = 62$), the rate of fluid administered was greater than or equal to 100 mL/hour in 55 (89%) patients.

Thirteen of 106 patients had an IV line running, but then discontinued, at some time during the last 30 days before death. Eleven of these 13 patients had reasons for stopping the fluids written on their charts. Patient or family wishes were most frequently cited, but not elaborated on (four patients). In decreasing order, other reasons were: inability to restart intravenous line (three patients), palliation only (one patient), comfort only (one patient), patient dying (one patient), and transfer of a patient who could not have hyperalimentation at the receiving hospital (one patient).

Limitations

The documents used to gather information retrospectively about the presence or absence of an IV were assumed to be valid. One must remain cautious, however, about the interpretation and inferences drawn from the recorded qualitative information of clinicians' notes. There is no way of knowing from this audit how accurately they reflect the actual thinking of the clinicians at the time of the decisions. We suspect that the record's incompleteness substantially reduced its ability to reflect the full, often complex situation of the encounter between patient, family, and clinician. This limitation could be especially true when one considers the probable "minor" nature of IV therapy as viewed in the overall care of patients with life-threatening illnesses.

Some information is also missing completely from the descriptive part of the audit for 30% of the clinicians, who wrote nothing about IV therapy.

In the matter of statistical inference, some minor caution should be taken because of the lack of association of primary tumour site with either IV group. A chi-square method was used for the seven categories; at least three cells, however, had expected values less than five, making this test less meaningful. When the categories were collapsed to four (all with adequate cell size), there remained no significant differences.

Discussion

In our hospital, 81% of patients (86/106) with malignant neoplasm received IV therapy at some time during the last 30 days of life, and 69% (73/106) died with the IV in place. These percentages correspond closely with the attitudinal findings of Micetich and colleagues[1] described previously, in which 73% of physicians believed that irreversibly dying patients, unable to eat or drink, should have IV fluids as a standard of care.

Should it be assumed that a procedure performed in most similar clinical situations is a tacitly accepted standard of practice? If so, in our hospital, the administration of IV fluids for those dying of malignancies could be identified as such a standard.

We believe this procedure needs to be questioned. In order to accept a proce-

Table 1
Selected Characteristics of Patients with IV and Patients without IV at Death

Characteristic	Patients	
	IV (n = 73) Mean (SD)	No IV (n = 33) Mean (SD)
Age in years	64.9(14.6)	69.6(14.4)
Duration of illness in days	700.8(1082.2)	938.7(1931.8)
Length of last hospital stay in days (n = 92)	19.9(21.6)	33.9(38.6)
Post-DNR order survival time in days (n = 89)	9.7(16.5)	20.9(30.1)

dure as standard practice, the reasoning, risks, and benefits should first be defined. From our practice experience, we believe some of the reasoning should be challenged. As well, a number of our hypotheses about current clinical practice could not be supported by the results of this audit.

Of the nine factors we believed might be associated with IV therapy, only two were found to be statistically significant in their association with the absence of an IV line at death.

Factors Influencing Decision

First, we speculated that patients who had been in hospital for a longer time before death would have been less likely to die with an IV line. Our hypothesis was that, with more time to fully appreciate the issue, both patient and clinician would come to see the progressively increasing burden and diminishing benefits as death approached. In fact, the patients receiving no IV fluids did have longer hospital stays (mean 33.9 days) than did those who died with an IV line (mean 19.9 days).

There is, however, an alternate hypothesis that could be supported by the data collected. It could have been that IV sites simply became harder to find as IV use continued in such debilitated patients. The second most common reason documented for discontinuing an IV in the last 30 days was the "inability to restart it."

A second factor postulated as reducing the use of IV fluids was the duration of hospitalization post-DNR order. We believed that, once a topic as sensitive as resuscitation had been discussed, the clinician, patient, and family would be primed to handle other particularly sensitive clinical decisions. It seemed only natural that longer survival would provide more opportunities to discuss the pros and cons of IV therapy. Of the patients with a DNR order, the group not receiving IV fluids did live significantly longer than the IV group (Table 1).

Two points must be made here. The first is that the reason for not having an IV in this group with longer survival could just as likely have been the lack of venous access as enhanced communication about the goals of care and patient-defined best interests. Second, one has to be curious about the nature of the groups' differences, which might have led the group not receiving IV fluids to have lived longer after placing the DNR order. Was there something different about the IV group that led to the writing of a DNR order sooner in the illnesses than in the other group? Perhaps those in the group not receiving IV fluids appeared to clinicians to be less advanced in their illness. This question certainly raises issues for those who believe that patients die sooner without proper fluid replacement.

Factors Not Influencing Decision

Seven remaining factors we believed might influence the decision on IV fluid use could not be shown to be statistically significant in their associations.

We had sensed from our consultation experience that clinicians (nurses and physicians) found the decision not to use IV fluids in older patients an easier clinical decision. Age, however, was not found to be significantly different in the two groups. Perhaps our bias originated from those experiences with the elderly who were referred to us; the elderly who were not referred might have been treated differently. This audit includes all patients who died of cancer, both the referred and non-referred.

The fact that neither primary tumour site nor the presence of metastases was significantly associated with either IV group could have been the result of two possibilities: either we were wrong in our belief that patients with certain tumour types and lack of signs of advanced disease were treated more aggressively or, simply, there were not enough data to realize statistical power to detect true differences. The second interpretation is supported by the small numbers found in the categories of tumour types in the group not receiving IV fluids.

Also not found to be a predictor of IV therapy in the terminal phase was the total duration of illness. As a result, patients recently diagnosed did not seem to be treated more aggressively with IV therapy than those whose course of illness was long. Does this also mean that patients were no more likely to speak up against this therapy after a protracted fight with cancer than if the encounter was brief? We had thought that those who had had multiple hospital admissions, surgery, chemotherapy, radiotherapy, and so forth would be less likely to have an IV near the end of their illness as they declared "enough is enough." The data collected do not support this.

We also wondered whether barriers to communication, such as language, might have convinced clinicians to err on the conservative side and order an IV line. There were so few patients whose principal language was not English that we can say only that it should not have been a significant problem in our hospital. Other communication barriers that could be significant, such as dementia and confusion, were not considered in this audit.

Another hypothesis was that clinicians and patients might choose the commonly accepted clinical practice of having an IV line if the patient did not have a supportive family or friends. As death approached, the clinical indication for fluid therapy would remain un-

Table 2
"Do not Resuscitate" Orders at Death

Order	IV	No IV	Total
Yes	62	27	89
No	11	6	17
Total	**73**	**33**	**106**

Table 3
Evidence of Metastatic Disease at Death

Evidence of metastases	IV	No IV	Total
Known metastases	52	25	77
No known metastases	11	6	17
Total	**63**	**31**	**94[a]**

a. Presence or absence of metastatic disease could not be determined in 12 of 106 audited charts.

Table 4
Primary Tumour Sites for Patients with IV and Patients without IV at Death

Primary Tumour Site	IV	No IV	Total
Gastrointestinal	17	14	31
Hematologic	17	2	19
Lung	12	4	16
Unknown	12	3	15
Genitourinary	6	4	10
Breast	5	4	9
Other	4	2	6
Total	**73**	**33**	**106**

questioned because family members were not present to raise the issue of repeated venipunctures and other possible burdens of the intervention. Ninety-seven per cent of these patients had family members present during the terminal illness. Of the 86 patients who had an IV line during the last 30 days, only three of these IV lines were stopped at the family's request. Of course, the opposite scenario must also be considered. With a large network of family around, the opportunity for controversy could have arisen with patients or clinicians conceding to family wishes for IV fluids.

Chart Documentation

Later in the audit investigation, descriptive information was sought on the reasoning of clinicians in the use, the non-use, or the cessation of IV therapy. Of the 106 charts, 64 (60%) provided evidence of such documentation, often with more than one indication.

The delivery of medications ranked as the first (non-analgesic drugs) and third (analgesics) most common reasons for IV use. What were these specific medications and were there alternative routes for their delivery? These questions were not examined in the audit. Practice patterns in palliative care, however, describe the alternate routes by which analgesics can be used. For example, rectal or continuous subcutaneous administration of opiates can alleviate the need for IV use. Switching medications to the parenteral route when the oral route is no longer available should not be an automatic response. Antireflux agents, antibiotics, some cardiac drugs, and others might no longer be indicated in the face of a revised clinical situation and redefined patient goals.

Sixty-two of the charts with documentation had clinical notes indicating that the IV line was for purposes related to hydration. Ramsey, an ethicist, has argued that an IV line will relieve the thirst of a dying patient.[2] Is this the reason for the frequent use? The commonly held beliefs supporting this argument are concerned with relieving the distress of thirst, fatigue, weakness, and general suffering of terminal dehydration. There is no current evidence, however, to support or refute that IV fluids given to dying patients accomplish these goals.

Some would argue that IV fluids would at least relieve the dry mouth and the thirst. In fact, the prevalence of thirst as a symptom in dying patients is not known. It could be that the dying have reduced thirst as a normal physiologic response. Elderly men are known to have such a response.[3] Zerwekh describes how these symptoms, when present, can be relieved by frequent, well-administered mouth care[4]

Eleven per cent (seven of 62) of the charts that stated that the purpose of the IV line was hydration did not appear to have orders adequate to deliver hydrating volumes to an adult patient (i.e., less than 100 mL/hour). We suspected that this type of inadequate volume order was much more frequent than we found. Even if one included the 24 charts remaining in which there were no notes about the IV indications, the frequency of inappropriate volume ordering could be only 42% at maximum.

What about the reasons for discontinuing an IV once started? This happened in only 13 of the 86 patients who had an IV during the last 30 days. Eleven charts contained the reasons mentioned previously. The most significant observation is that not one of the notes gave a clinical argument about the benefits or burdens of the therapy, or indications or contra-indications, as they might for other medical therapies.

Emotional Factors

Finally, although not documented in patient charts, the emotional forces for IV use cannot be ignored. Intravenous use can symbolize the essence of an expression of caring and compassion. The provision of food (glucose) and water, when little else can be done, might be seen as the least one should do. Perhaps, though, it is not the least we should do if there are no physical benefits, if the burden of administration is great, and if families and individuals can be supported in a clearer understanding of this symbol. Should this symbol represent love and care to the family, we might be challenged to find other actions that could be substituted and found equally powerful.

Conclusions

We have shown that, in cancer patients, the use of IV fluids has indeed become routine practice in their terminal hospital stay. We conclude that no practice should be accepted as routine without evidence of benefit and the clarification of risks.

Prospective studies are needed to answer the important questions raised. Is there a way, ethically, to study the symptoms of dying patients who receive IV fluids and those who do not? We should know the prevalence of thirst and other symptoms in dying patients attributed by clinicians to be a reflection of terminal dehydration.

Perhaps patients and family members could be recruited to look more closely at the outcome of a well-described mouth care program as a comfort measure. We need to determine what the symbolic indications for an IV line are and what allows some patients and families to set the symbolism aside. It might be the burden of venipuncture or being connected to an IV pole, but until the concerns are explored we cannot know the risks and benefits of this standard of care. Both quantitative and qualitative explorations of these topics are needed. Without this information we cannot answer our original question: Is IV fluid use for the dying, in the absence of specific goal-oriented indications, a ritualistic medical last rite without scientific foundation? ■

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